RESOLUTION
March 25, 2004

WHEREAS the Missouri Air Conservation Commission (Commission) is aware that members of the St. Louis region's regulated community have engaged state and federal regulators in discussions related to future air permit applications of large NOx sources located outside and upwind of the St. Louis 8-hour ozone non-attainment area;

WHEREAS the Commission understands that the objectives of these discussions are both the protection of air quality in the St. Louis area and the development of a more transparent and predictable regulatory process for consideration of such permit applications;

WHEREAS the Commission understands and agrees that the conceptual elements of this discussion - which are focused on mitigation of potentially significant impacts of individual point sources on the region's ability to achieve the federal air quality standard for ozone – are intended to form the basis for a new rule;

WHEREAS the Commission agrees that the rule shall embrace the following principles:

- Any offsets required by such a rule will be meaningful, quantifiable, surplus and designed to achieve significant air quality benefits;
- The amount and permanence of any offsets required by such a rule will be tracked by the Air Pollution Control Program;
- This rule will expire 5 years from the date it is adopted. Additional technical analysis will be completed in the interim to determine if the rule needs to be extended to protect air quality, and if so, whether the threshold and offset levels require adjustment based on new scientific data;
- Nothing in the rule shall in any way restrict the legal authority of the department, program or commission to take any legal action necessary to protect air quality including for those proposed sources outside the area in which the rule is applicable.

NOW THEREFORE BE IT RESOLVED that the Missouri Air Conservation Commission hereby directs the Missouri Department of Natural Resources Air Pollution Control Program to continue and expand stakeholder discussions to develop a rule to address these issues. The rule shall address sources proposed for construction outside and upwind, of the St. Louis 8-hour ozone nonattainment area (to be designated April 15, 2004.) The rule will apply to such sources with the potential to emit greater than 900 tons of NOx during ozone season. Be it further resolved that the program shall set a goal to complete this rulemaking within 24 months from the date of this resolution. Following final promulgation of the order of rulemaking the Department's Air Pollution Control Program shall submit the rule to the U.S. Environmental Protection Agency for inclusion in the Missouri State Implementation Plan.

Joanne Collins, Chair	Frank Beller
Michael Foresman, Vice Chairman	Harriet Beard
Barry Kayes	Ernie Brown
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Strawman New Source Review Program for Missouri Attainment Counties with High Potential for Ozone Transport to St. Louis 8 Hour Ozone Nonattainment Area

The Prevention of Significant Deterioration (PSD) program is designed primarily to ensure continued localized attainment through the application of Best Available Control Technology (BACT). It is not designed to directly address regional transport of reactive pollutants over longer distances. Missouri Department of Natural Resources (DNR) presently attempts to mitigate nonattainment impacts on St. Louis through a case-by-case addition to the PSD process that involves modeling to determine impact on the St. Louis 1 hour ozone Maintenance Area and the application of incrementally more stringent controls. This case-by-case approach, based on broad Missouri statutory language but not set forth in any Missouri or federal regulation, introduces significant uncertainty for prospective businesses, and the modeling approach has inherent limitations.

When the St. Louis area is designated nonattainment for 8 hour ozone in April 2004, the more stringent ambient air quality standard will reinforce concern about large upwind sources of ozone precursors, and will pose new questions about when a case-by-case review would be triggered. A more systematic New Source Review/PSD approach should be developed for large major sources locating in bordering attainment counties that may affect the future 8 hour ozone nonattainment area. The following strawman is offered for discussion.

DRAFT STRAWMAN:

Only new emission sources or modifications in Perry, St. Genevieve, St. Francois, Washington, and Warren Counties that trigger PSD review for NOx are affected.. Such facilities would meet all the usual PSD requirements such as BACT controls, increment consumption, etc.,

PLUS:

New sources or modifications that have a post-control net emission increase of 900 tons NOx during the St. Louis ozone season, will meet one of three additional requirements:

1. The source applies an emission reduction strategy described in a. through c. below, singly, or in combination, sufficient to ensure that the overall net emission increase for NOx does not exceed 900 tons during the St. Louis ozone season.
    a. The source applies beyond-BACT emission controls to the PSD emission unit and/or accepts ozone-season operating limitations on the unit.
    b. The source obtains 1:1 emission offsets for NOx emissions , under the Missouri emission banking and trading rule (10 CSR 10-6.410).
    c. Prior to PSD unit startup, the source installs new or upgraded emission controls on an existing stationary emission unit(s) at the PSD installation. Emission credits recognized under this section are for reductions not already considered in the PSD determination of 'net emission increase.' Emission credits are limited to ozone season reductions that exceed existing control measures and are in excess of reductions required by any promulgated federal or Missouri rule.

    OR
2. If emission reductions and credits from option 1 above do not achieve a maximum overall net emission increase of 900 tons NOx during the ozone season, the source must either conduct modeling (option 3) or obtain sufficient offsetting Supplemental Emission Reductions (SER). SERs are expressed in dollars of expenditure for emission reduction. SER funds must be expended by the permittee, or transferred to a 3rd party trustee under contract to complete SER work, prior to operational startup of the new or modified emission unit that required PSD review.
    a. The minimum required SER dollar amount is calculated as follows:
        i. Determine the overall net ozone season NOx emissions (considering any emission controls, offsets, and credits from section 1. above).
        ii. Subtract 900 tons.
        iii. Multiply times $2412.[2]

[1]

[2] This valuation is based on EPA calculations of NOx control costs in the interstate transport rule proposal of Jan. 30, 2004, preamble page 4614. The predicted marginal cost per ton of ozone season-only NOx controlled under the proposed control strategy is $2200 in 2010. These estimates are expressed in 1999 dollars, however, so should be normalized in this proposal to the present day. The Consumer Price Index was 3.4% in 2000, 1.6% in 2001, 2.4% in 2002, and 1.9% in 2003. Applying these rates to $2200 yields a

b. SER funds may be used for the following emission reduction projects:
   i. Retrofit of mobile sources and nonroad equipment that operate primarily within the same county, or within the St. Louis ozone nonattainment area. To qualify for SER credit, on-road equipment must not be greater than 10 years old at the time of retrofit. Retrofit of equipment with engines manufactured in 2007 or later do not qualify for SER credit. If such equipment is not owned by the PSD permittee, the equipment owner must contractually agree to accept and maintain the retrofit equipment until the mobile source or equipment is sold or scrapped. These retrofit controls must be designed to reduce NOx and hydrocarbon emissions, though they may also control other pollutants.[4] The following retrofit equipment is approved for mobile/nonroad SER credit:
      1. Oxidation catalyst.
      2. Conversion of gasoline or diesel engines to use exclusively natural gas, LPG, propane, or hydrogen.
      3. Engine replacement, with an engine that meets California Air Resources Board emission requirements for new on-road or nonroad engines at the time of engine replacement.
   ii. [VOC or]? NOx emission control equipment purchased with SER funds may be installed on existing stationary emission sources owned by a third party within the same county, or within the St. Louis ozone nonattainment area. The third party owner must contractually agree to accept and maintain the emission control equipment until the emission unit is retired, replaced, or fitted with replacement emission controls. The third party owner must also agree to obtain a Missouri air construction permit with enforceable conditions, Resulting [VOC or]? NOx emission reductions must exceed existing emission control levels and those required by any promulgated federal or Missouri rule. Allowable SER costs exclude the replacement value of any emission control device being replaced by the SER project. The following equipment is approved for third party stationary source SER credit:
      1. Low NOx burners or exhaust gas recirculation systems.
      2. Oxidation catalysts.
      3. Selective catalytic reduction or nonselective catalytic reduction for NOx.
      4. [VOC destruction devices such as flares, fume incinerators, and other oxidation methods.]?

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present value of $2412. The rule will sunset and be re-evaluated prior to 2010, so projected NOx control costs beyond that year are not needed.
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[4] EPA Region VII will provide information developed nationally re typical retrofit costs and estimates of tonnage reduction per unit cost. These data may be useful in targeting the SER provisions to retrofits that are most cost-effective.

iii. Installation of anti-idling support equipment. This equipment includes electrical service and cab heating/air conditioning for heavy duty truck or locomotive idling areas such as switch yards, truck stops, rest stops, and loading docks, located in the same county as the PSD emission source or in the St. Louis ozone nonattainment area. To qualify for SER credit, the project proponent must develop documentation that average daily idle times at this location prior to installation of the equipment exceeds [q] engine-hours.[5]

iv. Other emission reduction projects approved by DNR. An approvable SER project will provide cost-effective VOC or NOx emission reductions which would not occur otherwise in a timely manner.

OR

3. Source conducts regional transport modeling, and submits results to DNR for verification. The model must demonstrate that post-control emissions of NOx from the new or modified emission source will not raise the predicted ozone level at any critical grid cell in the St. Louis 8 hour nonattainment area more than [2] ppb (eight hour average, 4th highest predicted value). Critical grid cells are those for which pre-project modeling indicates that the 4th highest 8 hour ozone level would exceed 80 ppb. [DNR staff propose an additional modeling test for non-critical grid cells, based on 5% of the NAAQS, or about 4.25 ppb. Many stakeholders do not agree that a second test for allowable rise in non-critical grid cells is appropriate..] Modeled post-control emissions will account for on-site emission levels, and also emission offset reductions obtained at other locations, if identifiable and not already considered in the emission inventory. Supplemental Emission Reductions will not be considered in the modeling. The source shall perform this modeling in accordance with 40 CFR 51, Appendix W, EPA Guideline on Air Quality Models. Application of the model must meet minimum requirements set forth in written guidance issued by the MoDNR Air Director after appropriate public comment (and adoption by the MACC?), that is applicable to all affected sources. A successful demonstration using any one of the models identified in the guidance shall be sufficient to meet this requirement.

[5] EPA Region VII will provide national selection criteria used in their new voluntary program. These selection criteria should be helpful in determining a level for [q].

Supporting Explanations

Why Perry, St. Genevieve, St. Francois, Washington, and Warren Counties?
The proposed EPA 8 hour attainment rule includes VOC sources within 100 km and NOx sources within 200 km of a nonattainment area in calculations of reasonable further progress reductions. In proposing this, EPA recognized that sources within 100 to 200 km have a significant impact on ozone nonattainment areas. Since the strawman would allow SER's that reduce either VOC or NOx, the 100 km limit is favored. Use of a 200 km radius would create a land area affected by beyond-PSD requirements approximately 4 times as large as a 100 km radius and would introduce significant uncertainty about whether the more distance sources would have any effect on St. Louis ozone levels.

For the five counties listed above, all or much of the county is located within 100 km of the St. Louis urban core. Based on St. Louis trajectory analysis, wind directions associated with high ozone values are from a southeasterly, easterly, southerly, and southwesterly direction, and the five counties are in these quadrants. Warren County is west of downtown St. Louis, but Warren County is to the southwest of northern ozone monitors that have experienced high ozone in the past, at West Alton and Jersey County, Illinois. Warren County also includes the Interstate 70 transportation corridor, where significant growth of new stationary sources would be anticipated.

Most of Lincoln County and a small portion of Pike County are within 100 km of the urban core, but they are not included in the strawman proposal. Both are north of St. Louis, a trajectory which is not associated with high St. Louis ozone values. Requiring beyond-PSD reductions from north of St. Louis would impose unnecessary costs for no appreciable St. Louis ozone benefit.

Why Ozone Season Emissions Only? Some of the beyond-PSD emission control measures will inherently reduce NOx emissions on a year-round basis. Others would require chemical feedstock or additional energy to operate in the non-ozone season, creating negative secondary environmental impacts that are unnecessary for the purpose at hand.

Why a 900 ton NOx plus VOC threshold for beyond-PSD requirements? The purpose of the strawman is not to impose additional requirements on all PSD sources, but only on those large enough to have a significant impact on St. Louis attainment.
The emission threshold should be 900 tons per ozone season of NOx emissions, for reasons described below.

A 900 ton threshold was derived by looking at a recent Missouri PSD permitting project located very near the St. Louis ozone nonattainment boundary. In that project, DNR determined that the allowable modeled rise in ozone levels at any critical grid cell should not exceed 2 ppb. Based on modeling at this particular location, the level of post-control ozone season NOx emissions needed to be in the range of 1400 tons or less.

However, this project was evaluated under the 1 hour ozone standard, whereas future projects will need to consider the more stringent 8 hour standard once the St. Louis 8 hour nonattainment area is designated by EPA in April 2004.

To normalize the tonnage threshold to an 8 hour standard, a ratio was calculated, based on ambient 8 hour and 1 hour monitoring data from St. Louis, for the period 1999 through 2003. Three different conversion methods were used:
--One hour maximum values were compared to 8 hour maximums. The same was done for the 2nd highest, 3rd highest, and 4th highest levels. Two standard deviations were then applied to the 0.85 average ratio, and an additional 10% error factor was added.
--One hour design values were compared to 8 hour design values. This yielded a minimum ratio of 0.72.
--The third approach was to determine a ratio based on modeling results, rather than ambient data.
While each conversion method yielded a somewhat different result, the tonnage thresholds were all in the 900 to 1000 ton per ozone season range. A 900 tons threshold was selected as a conservative estimate.

Why a [2] ppb modeled ozone increase? The allowable increase in ozone levels should be set at [2] ppb peak rise in 8 hour ozone levels. EPA used 2 ppb in the interstate ozone and fine PM proposal of January 30, 2004 as a screen for insignificant ozone contributions.[7] The 2 ppb threshold was also used by EPA as a basis for the NOx SIP Call of October 1998, for both the 1 hour and 8 hour ozone NAAQS.

EPA rules at 40 CFR 51.165(b) set PSD significance levels for sources that could cause a violation of the SO2, PM10, NO2, or carbon monoxide NAAQS. These federal EPA percentages range from 1% for NO2 to 5% for CO. EPA sets no significance level for ozone, due to the complexity of modeling the reactive precursors, [re-write needed if allowable increase is different from 2 ppb.]

The [2] ppb allowable increase needs to be expressed in terms of critical receptors or grid cells. The critical grid cells to be examined should be those where pre-project airshed modeling indicates that the fourth highest 8 hour ozone level would exceed 80 ppb. With this approach, the model would identify all the grid cells that already exceed the 8 hour NAAQS or are approaching exceedance, and determine whether an ozone increase greater than [2] ppb might occur at those locations

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[7] Page 4601. Jan. 30, 2004 Federal Register

Why BACT, beyond-BACT, and SER, rather than LAER? The 6/2/03 EPA 8 hour attainment proposal calls for BACT even within the boundaries of a Transitional Nonattainment Areas (likely to attain by 2007). It is unknown whether St. Louis will be a transitional area, but BACT beyond the nonattainment area is a reasonable baseline, given the potential extreme costs, business uncertainty, and low marginal emission reductions imposed by LAER. Beyond-BACT or SER is prescribed for those facilities that cannot obtain sufficient offsets to reduce emissions below the 900ton threshold, cannot meet the modeling criteria, or prefer to invest in pollution control, rather than expensive modeling.

Why 1:1 offset? Under the proposed 8 hour attainment strategy, the NSR offset ratio in the St. Louis nonattainment area would be either 1.1 to 1 or 1.15 to 1. The offset ratio beyond the nonattainment area should be lower, given the distance of the new source from the areas experiencing nonattainment.

Where would emission offsets come from? The existing Missouri banking and trading rule provides for trading within the same maintenance/nonattainment area, or within the same modeling domain for areas beyond the nonattainment boundary. By staying within a 100 km radius and within the counties that are most clearly within a St. Louis ozone modeling domain, the strawman fits within the scope of the existing trading rule.

Why would a facility prefer to obtain offsets rather than model? Offset purchase may be less costly than modeling, and offer a higher level of certainty about whether a major project is feasible. The strawman is structured so that offsets can be combined with other measures such as beyond-BACT controls and SER expenditures. In this way, project proponents can weigh the cost of offsets from different sellers and the number of offset credits available, to purchase offsets that are most cost-effective relative to other options.

Would air quality suffer if offsets are chosen rather than modeling? The scientific uncertainties and assumptions inherent in modeling pose their own risks. On the other hand, purchase of emission offsets increases the incentive for sources throughout the area to make early, surplus emission reductions that have a clear air quality benefit and a potential financial value. Emission reduction credits that are created within the nonattainment area, but used in areas further away from nonattainment monitors will tend to have a greater air quality benefit than the 1:1 offset ratio would suggest.

Why the Supplemental Emission Reduction (SER) Option? A very large source may be unable to obtain sufficient offsets to meet the 900 ton limitation. The Missouri emission trading rule has only been in place a short time, and a robust emission trading market has not had time to develop. Also, a very large new source needing offset credits and having no SER alternative could completely deplete the pool of available credits for a time. This could cause anomalies in market price and make credits unavailable to smaller businesses located in the nonattainment area. One of the environmental benefits of the emission trading rule is that businesses located in the nonattainment area have a mechanism to grow their business in place, rather than relocating to greenfield sites where lack of infrastructure and mass transit create higher secondary mobile source emissions. The SER option is basically a relief valve, so that the strawman does not force depletion or price spikes in the offset credit market.

SER valuation represents the value of a ton of cost-effective NOx control, about $2400 per ton. Valuation levels will be revisited in the future during review prior to rule sunset.

The strength of the SER approach is that emission control expenditures often have much higher air quality benefit if applied at an emission unit or emission source other than the permitted unit, which must already meet BACT. Also, mobile source retrofits installed under a SER would have year-round benefits and ancillary benefits for fine particulates and diesel HAPs.

Why the Geographic Limitation on SER Expenditures? The strawman would require that equipment purchased with SER funds be installed within the same county as the permitted project, or within the 8 hour ozone nonattainment area. The same-county requirement focuses SER emission reductions in the same general trajectory as the source. We anticipate that most project proponents will prefer to use SER funds within the same county, to build local support needed to site such a facility. However, some of these attainment counties are sparsely settled and have little industrial activity at present, so may have limited opportunity to make effective use of SER funds. For that reason, SER funds may also be directed to stationary and mobile sources within the nonattainment area.

How long would this NSR approach be in place? The Missouri Air Conservation Commission has approved a resolution that would set a five year sunset provision on the rule. At that time modifications may be appropriate, given presumed success of the Interstate NOx/SO2 transport rule or Clear Skies and VOC reductions from numerous MACT and mobile source rules. Since this program would apply to an attainment area, rather than a nonattainment area, EPA's "backsliding" policy should not apply.

Should Beyond-PSD rules be included in the 8 hour ozone attainment SIP? The resolution approved by the Air Conservation Commission envisions that the rule would be part of the Missouri SIP.

Would beyond-PSD requirements in attainment areas violate the .055 clause of the Missouri Air Law? The statute states the following: "The restrictions of this section shall not apply to the parts of a state implementation plan developed by the commission to bring a nonattainment area into compliance and to maintain compliance when needed to have a [EPA] approved state implementation plan. The determination of which parts of a state implementation plan are not subject to the restrictions of this section shall be based on specific findings of fact by the air conservation commission as to the rules, regulations, and criteria that are needed to have a [EPA] approved plan."

How would this strawman affect PM 2.5 nonattainment? Since NOx is a precursor of PM 2.5 as well as ozone, the proposal is likely to have an incidental beneficial impact on

PM 2.5. In some cases additional VOC and NOx emission reductions would be limited to the ozone season, but in other cases (ex. mobile source SER projects) year-round benefits would occur.

The strawman does not address fine sulfate particulates and their precursor, SO_2, not does it address direct emissions of fine particulates. In addition to the greater scientific uncertainties about fine particulate, the .055 clause of Missouri law would prohibit imposition of new regulatory requirements for fine particulate attainment until the St. Louis nonattainment area is designated. At some point in the future, when effective fine particulate attainment strategies are better understood, the strawman could be reviewed to determine if including very large sources of SO_2 or year-round emissions would be helpful.

Large Upwind (NOx) Source Issue Summary

There is a need for EPA and/or states' air agencies to develop a policy, guidance, or rulemaking with respect to permitting of very large sources upwind of ozone problem areas (1-hour and/or 8-hour). New, large upwind sources could contribute adversely to existing nonattainment areas and cause long-term problems with attainment or maintenance. Specifically, the increase in emissions from very large sources could require very costly controls on the downwind problem area in future State Implementation Plan development. In addition, large sources of NOx could also affect fine particulate problem areas.

Therefore, it is important that decision-makers understand this concept of future hardship when defining the impact of new development in upwind areas (economic and environmental). Ground rules must be determined in order to develop this type of policy or guidance. These rules should address the sources that will trigger an evaluation for downwind ozone (later, fine particulate), the criteria for determining "significant impact" for that evaluation, and, if necessary, options for mitigating the downwind impact.

The attached issue paper details the options for consideration and provides a summary of the pros and cons of each option. The paper is divided into options for the significance determination and the remediation steps. The significance determination can be accomplished with any, all, or some combination of the proposals. In a manner similar to the current PSD permitting program, a source could be included if its emissions met certain size criteria on a raw tonnage or a percentage of the downwind area inventory basis. Also, a source or a responsible agency could perform photochemical modeling to ascertain the impact of the source on the downwind area. In addition, each one of the steps could provide an "out" for the source if it passed the significance criteria in any one of the steps (PSD-like evaluation).

The remediation steps could include: LAER, innovative control technologies, or offsets. Offsets could be utilized on a one-for-one basis within a control region, scaled offsets ratio closer to or further from the downwind area (emission reductions within the downwind area would be worth more than emission reductions 200 km from the area). The control step is bounded by the PSD permit program on one end and the nonattainment area permit program on the other. It would be illogical to require an attainment area source to do more than what is required under a nonattainment area permit. However, if a source has a downwind impact on an ozone area, it would be illogical to assume that the PSD program would address those concerns. The current PSD program has very limited protection for ozone air quality and this process could be utilized to fill that gap.

Large Upwind (NOx) Source Issue Paper

BACKGROUND

Since the Ozone Transport Assessment Group process and before, there has been a realization that regional control of large NOx sources is effective in reducing ozone concentrations in downwind ozone problem areas. While local NOx control sometimes causes "disbenefits" to particular problem areas, upwind regional NOx control reduces the incoming concentrations of both ozone and NOx to problem areas. The controls included in the NOx SIP call, along with local VOC controls, are the mechanisms for most nonattainment areas to demonstrate compliance with the 1-hour ozone standard. Therefore, even distant (hundreds of kilometers) upwind NOx sources have a deleterious effect on downwind ozone concentrations.

Recently, there have been several very large NOx source permit applications in close proximity to downwind ozone problem areas. These sources would be permitted in a current attainment area with a Prevention of Significant Deterioration permitting program and not a nonattainment permitting program. The PSD program does not include Lowest Achievable Emission Rate (LAER) provisions, offset provisions, or relocation provisions. However, it does include Best Available Control Technology (BACT) which is based on cost-analysis as well as emission rates. Offset provisions in nonattainment area permitting ensure that sources will offset their emissions with at least a 1.1:1 offset (the ratio is based on the severity of the nonattainment classification and is higher for more polluted areas).

There is no guidance or national policy on permitting of very large upwind NOx sources on ozone nonattainment areas because of the complexity of this issue and the difficulty in determining "how much is too much" impact on the downwind area(s). The basis for trying to evaluate upwind NOx sources during the construction permit process is that educated decisions must be made before permit issuance so additional controls or offsets (if required) can be accounted for during the design phases of a project. Control retrofits are more costly and difficult to accomplish. If large sources that impact downwind ozone areas are permitted, then state agencies will likely have to address them with a SIP revision that could include more costly controls on sources within the downwind area. The ultimate decision about permitting these large sources requires a broad view of the costs associated with all aspects of the project and its downwind impact. That evaluation must be done beforehand to allow the state agency the opportunity to understand the impact from upwind projects. This issue paper will develop and present options to address the permitting of very large NOx sources upwind of ozone problem areas.

Some attempts have been made in addressing this issue by states facing the problem of permitting large NOx sources upwind of ozone areas. One to one offsets are the current policies in some states. Modeling significance levels are used in other states to determine permit approvability. There are two crucial decision points in the process for determining whether a large NOx source permit should be issued in an upwind area: (1) determining the impact of this source on the downwind area(s) and (2) remediating the impact if necessary.

The first decision point is the more difficult to address from a technical standpoint and could require: (1) the indirect use of existing EPA policy on NOx control for nonattainment areas, (2) photochemical modeling techniques, or (3) some combination of these two methodologies. The second point is more difficult to address from an implementation standpoint. This decision could involve permit denial, additional control requirements, or offsets with a potential cap for large NOx sources in proximity to nonattainment areas.

ISSUES

1) Determination of "significant impact" on downwind ozone area

Potential Methods for determination –

- A) Emission inventory analysis
    1) Distance vs. tonnage
    2) Percentage of total ozone area inventory plus "buffer"
    3) Assigning significance to very large sources
- B) Photochemical grid modeling (attainment demonstration or other regional modeling exercise) to significance level

A) Emission Inventory Analysis

1) Distance vs. tonnage

The question of distance and emission tonnage is important because a new NOx source that emits 250 TPY or about 0.7 TPD and is located 300 km from a downwind ozone area would not have a sufficient impact to evaluate further. However, a 20 TPD NOx source that is located 5 km from a downwind ozone area would certainly have sufficient impact to consider further evaluation. The answer to this question may not be a straightforward tonnage per day or year.

Instead, it could be a tonnage/distance calculation with some restrictions. The other problem with specifying a particular tonnage is that every ozone problem area is different with different precursor emissions, incoming background concentrations, and predominant wind directions. The concept of decreasing ozone impact as distance increases is widely accepted and was documented during the NOx SIP call development and the OTAG process. However, based on the problems specified above, each area would have to develop a relationship for large precursor sources to determine what distance/tonnage combinations would have a significant contribution (possible modeling). While based on strong scientific principles, this concept would be area specific and would require extensive work by states and EPA. If this work is conducted, this option would become a strong candidate for policy development.

2) Percentage of total ozone area inventory plus "buffer"

This significance concept was developed for use in Rate of Progress Plans and SIP development for serious areas searching for additional VOC and/or NOx reductions to meet the additional 3 percent per year requirement. EPA has determined that emission reductions within 100 km for VOC sources and 200 km for NOx sources can be used (on a one-to-one basis) to substitute for additional nonattainment area reductions.[1,2] This is important because it establishes emissions from buffer areas have sufficient impact on ozone air quality to use for control purposes. Therefore, EPA has already decided that emissions with these areas are significant and contribute to ozone formation in the downwind problem area. If the emissions in these areas are significant, what is the percentage of the total downwind area inventory that would be sufficient for a single project to cause a significant contribution? It would seem that since a minimum of 3 percent of the entire inventory is sufficient for control, that a smaller percentage would be appropriate for this type of evaluation. Based on existing attainment demonstration and sensitivity modeling analyses and EPA's control decision, one or two percent of the overall inventory would seem reasonable. One of the problems with this approach is that the inventory is perpetually increasing and 1-2 percent of today's inventory may be 0.75-1.5 percent of a future inventory. Also, the distance argument is valid here. For example, a 0.9% source would have more impact at 5 km from the area, than a 1.0% source at 199 km from the area.

[1] Guidance for Implementing the 1-hour Ozone and Pre-Existing PM10 NAAQS, Richard Wilson, Acting Assistant Administrator for Air and Radiation, May 1997

[2] NOx Substitution Guidance, Office of Air Quality Planning and Standards, December 1993

The buffer area concept is the most documented and thoroughly reviewed concept of the available choices. The distances were developed through the FACA process for ozone and particulate matter and the substitution guidance was used in numerous attainment demonstrations (federal rulemakings). These facts make this option a valid choice for inclusion in an upwind source policy.

3) Assigning significance to very large sources

This idea would have to be in conjunction with distance criteria like the 100 km or 200 km buffer zone. EPA has proposed classifying large sources for the purposes of the consolidated emissions reporting rule [(3)] as Type A sources. These sources have annual emissions reporting requirements. Type A sources in attainment areas are defined as: VOC greater than 250 TPY or NOx greater than 2,500 TPY. A significance determination based on source size does not account for the size of other sources in the downwind area. However, at least, NOx sources of this size would likely have a contribution to many potential downwind areas.

<u>B) Photochemical Modeling</u>

Photochemical modeling for single sources is difficult and time-consuming. In addition, the current grid models were not designed to determine the impact from single sources on a downwind area. However, these models are the best indicators of the impact on ozone areas from potential new sources. Many have expressed concerns that even large changes in emission inventories (large, potential NOx sources) would have no modeled impact in downwind ozone concentrations. However, if a source is shown to have a downwind impact in a photochemical grid model, then it can be assumed to be significant. During the development of the NOx SIP call, EPA used a criterion of 2 ppb to determine significance of downwind ozone impacts from all anthropogenic sources in an upwind state. Therefore, the greatest increase from an upwind source to be considered insignificant would be less than 2 ppb on peak (or above 125 ppb) ozone concentration. If the methodology used to determine the significant impact levels for NO_2, SO_2, PM_{10}, and CO is used, the signficance level would be a percentage of the standard. However, the difficulty arises when the benchmark is chosen for this comparison. Should the modeling exercise use the attainment demonstration for a particular area, the base case modeling for the area, or some other modeling exercise? Should the significance level be a function of overall modeled concentration (e.g. concentrations above 125 ppb) or should the significance level be based on the peak ozone concentration on a

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[3] Consolidated Emissions Reporting Rule (CERR), Final Rule, EPA Office of Air Quality Planning and Standards, June 10, 2002, CFR Volume 67, Number 111, p. 39602-39616

particular episode day? These questions are at the heart of the discussion regarding modeling significance levels.

If modeling is chosen as the means to determine significance, then the recommendation would be to use two different criteria for determining significance. The first would be a comparison tool with the peak value on each episode day modeled. In theory, these days would have peak concentrations below the standard because they were used in the attainment demonstration (post-control). A one percent (1%) portion of the NAAQS should be used as the significance level (1.25 ppb for 1-hour ozone concentrations and 0.85 ppb for 8-hour ozone concentrations). There is still a question regarding using days that might not show impact on peak ozone due to wind directions that don't have source plume overlap with the urban plume. Sensitivity analyses could be used (artificial wind fields or source relocation to an upwind location) to address this situation. The second criteria would be an overall downwind impact from the source on ozone concentrations within the modeling domain. This downwind impact level would be established based on ten percent of the applicable ozone standard (12.5 ppb for 1-hour ozone concentrations and 8.5 ppb for 8-hour ozone concentrations).

As stated previously, modeling <u>any</u> impact from a single source on downwind peak ozone could be significant. However, based on the uncertain nature of the photochemical model performance evaluation process, a number greater than zero should be selected. The maximum impact from a single source that could be chosen to show less than significance would be 2 ppb (NOx SIP call). This number is obviously too high due to the manner in which it was used by EPA in the SIP call analyses. Also, EPA has established other criteria pollutant significance levels based on a percentage of the applicable air quality standard. Therefore, a percentage of the standard is a logical choice to be used for the significance level.

Another modeling approach could be to use the attainment demonstration test. If the modeling does not show that the attainment demonstration would be compromised with the new source, then the modeled test would be passed. This test is less rigorous than the significance test and brings up questions regarding meteorological episode representativeness. However, if the modeling did show a problem with the demonstration, then it is assumed that remediation would occur for this source.

The answer to the definition of significance could be a series of negative responses to the options listed above. For example, if a source is less than one percent of the total downwind inventory for that pollutant, then the source would be considered to be insignificant. However, if the source was greater than one percent of the inventory, but could meet the modeling significance test it would pass the overall test. This step-wise solution would be analogous to the current PSD permit process by using the inventory as the first step and then modeling for compliance with the NAAQS and PSD increment as more refined steps. This process is less certain and would require a case-by-case decision. There are two more issues associated with the definition of significance: (1) NOx SIP call utility emissions/new sources and (2) a comprehensive evaluation of more than one new source upwind of a particular downwind area.

Utility emissions in NOx SIP call states are under a budget for that state and each state must apportion tons within that budget to the affected sources. So, if a new source that met the definition of electric generating unit under the NOx SIP call was permitted, would that require an evaluation since the total budget could never be exceeded? The problem is that the new source could purchase allowances from a distant state under the EPA trading program and the proximate downwind area would still have the same ozone impact. This issue is one of local scale impacts versus the collective national improvement of air quality. One solution would be that these sources would offset their emissions with local tonnage and not from outside the area. Unfortunately, there is no cap on large non-utility sources to use in this fashion.

The comprehensive evaluation of several sources upwind of an area is a difficult question. Individually, each source could meet all the criteria of less than significance. Collectively, all sources might not meet these criteria. This would be a decision similar to an increment evaluation under the PSD program. Are these air resources consumed on a first-come, first-serve basis? Should a budget exist (like a general conformity budget) that each state must rectify on an on-going basis as a SIP revision? There is little support in the conformity regulations for such a practice. The regulations even say that a federal government source undergoing PSD or nonattainment area permit review are exempted from a conformity evaluation. However, the Acid Rain program and the NOx SIP call establish state budgets for large, utility sources and other sources. These budgets could be used in a restrictive fashion to ensure that downwind areas are not influenced.

2) Remediation Options

Potential Methods for remediation –

A) Additional control technology requirements (beyond BACT)
   1) LAER
   2) European or other technologies
   3) If currently no additional control available, retrofit commitment from source

B) Offset requirements
   1) Nonattainment area offset ratio within the downwind area
   2) One-to-one offsets in the buffer zone (100 or 200 km)
   3) Scaled offsets ratios with respect to distance (less offset as distance increases)

C) Combination of (A) and (B)

D) Budgets (General Conformity or SIP Call)

E) No action

Remediation of significant impacts on downwind ozone areas is bounded by two sets of control requirements. One is the nonattainment area permitting program which includes lowest achievable emission rate (LAER) technology and offset requirements at various ratios depending on the severity of the nonattainment problem. The other is the prevention of significant deterioration (PSD) program that includes best available control technology (BACT) and a modeled exercise to ensure NAAQS and increment compliance. One can assume that any large project in an attainment area would be required to install BACT controls (cost-driven evaluation), but would not otherwise require emission offsets or LAER. Depending on the type of source (e.g. boiler, kiln, I/C engine, turbine), the controls available for NOx control could be very good or non-existent. This discrepancy makes it difficult to establish control technology requirements as a broad-based solution to this problem.

<u>A) Additional Control Technology Requirements</u>

1) Lowest Achievable Emission Rate (LAER)

This type of control produces the lowest amount of emissions possible using currently proven technology. It does not include cost analysis and, therefore, would force facilities to implement the most effective control that is in practice right now. In addition, it is a nonattainment area requirement for new source permitting.

2) European or other innovative technologies

Some of the controls used in the United States currently were not considered BACT or LAER because they were not commercially available. Many control strategies were developed in Europe, shown to be effective, and imported here. European technologies have driven many of our current practices and current European control practices could be incorporated in this policy to pursue innovative or developing emission controls. This approach would be beyond the current regulatory guidelines and would "break new ground."

3) Future control commitment

If no new control were being developed or contemplated, a different approach would be to place a requirement in the facility's permit to require a periodic (2-5 year) evaluation of available controls. This would continue to push that facility to pursue additional emission controls while letting the current project move forward. Unfortunately, retrofit technology must be planned for in advance (plant layout, space for additional control equipment, etc.) and it would be difficult to know what this future control would entail. There is one other problem with this approach. The level of control would need to be decided beforehand to ensure if the company met this level no additional action would be necessary. Again, there is little precedent for such an approach in the current regulatory guidelines.

<u>B) Offset requirements</u>

1) Nonattainment area offset ratio within the downwind area

The concept of offsets is appealing because the "new" emissions replace "old" emissions and the net emission increase is zero or less than zero. Offsets at the same ratio as the downwind problem area would be a nonattainment area requirement. The assumption is that these emissions should be offset in the same fashion as emissions in the nonattainment area. This logic follows from the 100km and 200km buffer zones introduced in previous guidance.

2) One-to-one offsets in the buffer zone

This concept is less restrictive than the nonattainment offset ratio concept. It would apply to sources in the buffer zone and offsets would be allowed in the same zone. This would increase the potential to find offsets and allow more opportunity for projects to proceed. One of the problems with this construct is the downwind ozone impact from the offset location could be dramatically different than the new source location. This could be good or bad for the downwind area depending on the predominant wind direction when ozone concentrations are high and the location of the sources in question. The collective contribution ideology used by EPA in the NOx SIP call could be used here to say that emission reductions anywhere in the airshed would help overall national or regional air quality.

3) Scaled offsets ratio

As distance increases from a downwind area and emission size decreases, the impacts from a new source would be reduced. Therefore, the concept of scaling offset ratios with respect to distance is appealing from a technical perspective. Once a source is found to be significantly impacting a downwind area, then a decision must be reached on the amount of emission reduction necessary to make the contribution insignificant. In general, the offsets necessary for any source to make a finding of insignificance could be less than one to one. This thinking would make a case-by-case decision necessary and would not be a simple test for new sources.

If allowed, offsets could include cross-pollutant transactions (VOC for NOx, NOx for VOC). This decision would have to include an understanding of the current situation within the downwind area (NOx or VOC limiting) and might require ratios to establish an equivalency. This equivalency process would be very cumbersome and might be better served in the context of a specific modeling exercise for these transactions. Cross-pollutant exchanges would be extremely complicated, but EPA has allowed areas to use NOx reductions to substitute for VOC reductions in ROP plans. Therefore, this provision must be considered in this policy.

C) Combination of additional controls/offsets

Any combination of the options discussed in (A) and (B) could be used to remediate downwind impacts. For example, the LAER controls could be paired with a scaled offset for a source that was 150 km upwind of the area. Each combination has advantages and disadvantages. In general, the more offsets required the less innovative or experimental the potential control would have to be and vice-versa. In fact, some of the source groups currently controlled in the EPA NOx SIP call have very limited control opportunities in practice (kilns). Therefore, that group might have to rely on emission offsets more than controls at this time.

D) Budgets (also could be part of the significance discussion)

State-wide or SIP call partial state budgets could be used as an enforceable mechanism to control large upwind NOx sources. However, the current SIP call does not have an enforceable budget for non-utility sources. It is possible that this budget could be developed and incorporated in the SIP process for the NOx SIP call. However, this does not help areas outside the SIP call control region and the other programs designed to control emissions (Clear Skies) focus on utility sources only at this time. A budget could be developed for each downwind ozone area using the 100/200 km buffer zone and this budget could be an enforceable piece of a SIP. As stated earlier, the general conformity regulations for government actions provide a framework for this type of action, but do not allow the provisions to be used in this fashion. Budgets would provide a target for each state to manage and help decide if a source would require offsets or additional controls for permit issuance.

E) No action

The no action alternative to remediation would be to allow the source to build and postpone possible future planning actions on the source and its downwind community until the next SIP. These actions could include additional local controls in the downwind area and retrofit controls at the newly permitted installation (or not). This choice could make the downwind community responsible for additional (potentially more costly) controls to subsidize the development of projects upwind of their area. This option would be the easiest on the new project and potentially the hardest on future air quality and planning actions.

The next steps for development of this policy will depend on the action taken by the large group. From a technical perspective, if the large group decides on the tonnage/distance option, then more modeling must be conducted to develop a curve for each downwind area to understand the need for remediation. However, if the large group decides on the buffer zone percentage, no additional modeling is necessary and the policy could go forward.

There is still a need for legal analyses on each one of these options to help determine if there are significant legal barriers with each. Many of these options rely on existing guidance or policy and extrapolate from that. Nonetheless, a legal opinion would be beneficial to understanding other potential problems.

OTHER SECONDARY ITEMS

The following is a list of some other issues that will need to be discussed in the development of any policy, guidance, or rulemaking on large upwind sources.

1) Inclusion of this type of new source review approach as part of the 8-hour ozone implementation guidance.

2) An "alternatives analysis" conducted under the mitigation step could be included as a part of the permit process. This would be very similar to the analysis in the current nonattainment area permitting program.

3) A.) Could non-permanent (discrete) emission reductions in a market-based approach like the NOx SIP call count toward offset requirements?
   B.) Could source closure reductions be used in the same manner?

4) If this policy is being developed for ozone and/or PM_{fine}, is there a need for the differentiation of seasonal versus annual emission reductions for use in offset requirements?

5) The development of a detailed single source model for ozone to use in determining the relevant downwind impact. This would need to be far more sophisticated than the current Reactive Plume Model (RPM).

Significance Determination Options

Emission Inventory Analyses	
Distance/Tonnage This option would allow a significance determination on a case-by-case basis with a decision made regarding the size of the project with respect to the distance from the downwind area.	
Pro	Con
• Realization of all available information including distance and emissions • Directionally accurate (closer sources contribute more)	• Requires extensive modeling for each downwind area to determine significance • Case-by-case determination (no certainty for new source)
Percentage of total area inventory This option would allow a significance determination on a case-by-case basis with a decision made regarding the size of the project in the buffer area with respect to the total downwind area inventory	
• Based on existing EPA guidance with respect to ROP and SIP development (already subject to rulemaking) • Concept-driven (increasing inventory causes air quality to be worse) • Defined criteria (once % is selected) • No need for further modeling • Based on current situation within the downwind area (small inventory would allow a smaller increase)	• Buffer zone (100 km for VOC and 200 km for NOx) is not beyond question • No guidance on particular % • Distance problem (3 TPD source at 199km vs. 3.1 TPD source at 5km) • Inventory increases and the TPD increase for a particular significance percentage would increase in the future
Large Sources only This option would allow a significance determination with a decision made regarding the size of the project in the buffer area	
• Pre-defined large source from EPA guidance (2500 TPY NOx) • Pre-determined significance (large sources contribute more) • Defined criteria	• Buffer zone and distance problems • No understanding of different downwind situation (only large source in buffer zone)
Photochemical Modeling Analyses	
Attainment Demonstration and/or Significance Level This option would allow a significance determination on a case-by-case basis with a decision made regarding the impact of the project in the downwind area (continued attainment or significance level)	
• Best available impact assessment • Initially allows for assessment of problem area (NAAQS compliance) • Provides a test for facilities to meet (significance level) • Based on established significance level analyses (%, PSD permits) • Guidance from EPA on significance level for entire states (2 ppb) • Applicable to any area where photochemical analyses are complete	• How big is big enough to model? • No direct guidance on particular impact as significant ("any impact is sig.") • Model was not designed to evaluate single source impacts • Episodes with meteorological conditions that don't allow a direct comparison with the new source • Significant resources expended every time modeling is completed

Remediation Options

No action This option would allow the new source to construct the new project without additional controls or offsets.	
Pro	**Con**
• No additional requirements (easiest for construction to occur) • Follows current PSD permit program	• Most likely scenario to cause air quality problems in the future • Potentially causing the downwind area to subsidize the development upwind
Additional control technology This option would require the new source to use either LAER control, an innovative control, or make a commitment to install controls in the future.	
• Same format as existing permitting programs (technology forcing) • Would result in smaller emission increases and downwind impacts • LAER is based on existing nonattainment area permitting (no cost-evaluation, but currently available) • Innovative control and future controls require a commitment from the company to make an emission improvement	• No set emission increase number for each situation (problem with all technology forcing programs) • Outside of the current regulatory framework for permitting • Effective controls may not exist currently for some types of sources (kilns) • For innovative or future controls, there is no guarantee controls would work and development timing might be unknown • Final hurdle for the company would need to be known before permit issuance
Offset requirements This option would require a source to find emission offsets in the area to allow the new source to construct.	
• Same format as existing nonattainment area requirement • Would require (at least) a portion of the new emissions to be accounted for • Specific requirement, easy to understand • No LAER or innovative (subjective) control requirements • Allow a scaled approach if necessary (less offsets further from the area) • Under the NOx SIP call utilities are required "offsets" within trading region	• Emission offsets are difficult to find • Potential distance vs. impact problem and directional issues (offsets from a different upwind region as the source) • New requirement for attainment permits • How many offsets would be required, enough to show less than significance or the whole emission tonnage?
Budgets This option would require each state to establish a budget of sources within a specific upwind area (buffer zone) and require the state to manage air resources within the budget.	
• Budget could be based on general conformity and NOx SIP call (existing) • Allows for a comparison tool with respect to current air quality • EPA could require SIP changes that would support these budgets making them federally enforceable	• Conformity is not a strong reference • Could lead to state/EPA delaying action until after the project is complete • Must still define significance and remediation with this choice • Could be an ever changing mechanism with different requirements over time

Large Upwind (NOx) Source/Buffer Zone Issue Summary – April 2004

There has been a need for EPA and/or states' air agencies to develop a policy, guidance, or rulemaking with respect to permitting of very large sources upwind of ozone problem areas (1-hour and/or 8-hour). New, large upwind sources could contribute adversely to existing nonattainment areas and cause long-term problems with attainment or maintenance. Specifically, the increase in emissions from very large sources could require very costly controls on the downwind problem area in future State Implementation Plan development. In addition, large sources of NOx could also affect fine particulate problem areas.

Therefore, it is important that decision-makers understand this concept of future hardship when defining the impact of new development in upwind areas (economic and environmental). Ground rules must be determined in order to develop this type of policy or guidance. These rules should address the sources that will trigger an evaluation for downwind ozone, the criteria for determining "significant impact" for that evaluation, and, if necessary, options for mitigating the downwind impact.

Over the last few years, MDNR has worked with EPA and the Illinois EPA to discuss this problem with respect to the 1-hour St. Louis ozone nonattainment area. These discussions were helpful in identifying the potential difficulties with addressing the upwind source issue, but the discussion never progressed to the next steps. The issues of defining a modeling "significant impact", proposing a tonnage threshold for elimination of small sources, and defining the mitigation steps necessary for project approval with respect to ozone impacts were never fully addressed.

Since the development of the 8-hour ozone designation recommendation by MDNR, the industrial community in the St. Louis area has shown great interest in pursuing the development of this type of proposal. This group expressed a desire to gain a level of certainty with respect to ozone evaluations upwind of the St. Louis area and potential requirements for permittees. Several meetings have been held between the regulated community, EPA, and MDNR staff to discuss and further pursue decisions for development of a rulemaking. This process is currently on-going, but the Missouri Air Conservation Commission signed a resolution that directs the APCP to proceed with a rulemaking that will control sources with a potential to emit greater than 900 tons NOx per ozone season within select counties upwind of St. Louis.

Currently, the discussion has focused on a modeling significant impact level of 1 ppb to be used in a manner similar to the current PSD permitting program. Based on previous modeling activities, the downwind impact from a source approximately this size would be less than 1 ppb. This level would provide a margin of impact for individual sources to consume while maintaining an appropriate level of concern for on-going downwind problems in St. Louis.

The remediation steps currently being discussed include (1) conventional offsets within the project county or the downwind area for NOx emissions greater than 900 TPOS and (2) supplemental emission reductions (SER) for NOx emissions greater than 900 TPOS. These SERs provide a mechanism for sources that cannot find sufficient offsets to meet project requirements. SERs are expressed in dollars of expenditure for emission reductions. These dollars would be spent on control equipment or other emission reductions projects approved by the APCP.

The control step is bounded by the PSD permit program on one end and the nonattainment area permit program on the other. It would be illogical to require an attainment area source to do more than what is required under a nonattainment area permit. However, if a source has a downwind impact on an ozone area, it would be illogical to assume that the PSD program would address those concerns. The current PSD program has very limited protection for ozone air quality and this process is a major step toward to filling that gap.

Methodology for Establishing Maximum Modeled Difference Thresholds for Inclusion in "Buffer Zone" Rulemaking

GOAL: Establish maximum modeled difference thresholds in parts per billion (ppb) that will define possible exclusion for sources in a PSD-plus evaluation related to 8-hour ozone impacts in St. Louis. These thresholds should be based on: (1) minimization of ozone impacts on the surrounding communities and downwind St. Louis, (2) previous modeling activities and experience gained with the 1-hour ozone attainment demonstration, and (3) the tonnage threshold for source exclusion (900 tons NOx per ozone season).

DISCUSSION: The use of previously approved permits for the purpose of defining criteria to examine these thresholds is necessary to provide a benchmark, but should not be viewed as a complete and comprehensive tool. The decisions made by the department on previous permit actions do not represent a simple threshold for inclusion/exclusion, but do represent a level of emission control that helps protect the St. Louis community while factoring the economic needs and costs for industrial development in the outlying area regarding a specific project. In addition, all previous permit actions have been examined for the 1-hour ozone NAAQS and, not the more stringent 8-hour ozone NAAQS.

The use of any and all modeling results should be carefully considered. The use of few episode days to make these difficult choices is problematic due to changes in incoming background pollutants, varying meteorological conditions, and incomplete or nonexistent overlap of new source plume and downwind ozone plume. However, the episode used for the previous analyses is one with southwesterly wind directions that will be upwind for some of the counties in the rulemaking.

There have been concerns raised regarding the current ozone models' ability to distinguish concentrations differences less than 1 ppb. While the overall accuracy of the model does not allow for prediction of concentrations to a 1 ppb level, our experience is that these models are designed to predict the difference in concentration to a fairly high degree of certainty (development of controls to demonstrate attainment). Also, in general, the photochemical models used for this purpose are known not to respond to "small", single source changes in ozone precursor emissions. In previous discussions regarding this issue with EPA headquarters, they expressed that any modeled impact from a single source is significant. This information leads to the conclusion that a very small percentage of the NAAQS can and should be used for the modeling thresholds.

When EPA uses photochemical modeling to determine significant impact of entire states on downwind areas (NOx SIP call and ozone IAQR), the changes in emissions are orders of magnitude greater than the levels considered here. In addition, the use of a state-size emission area will provide opportunity for impacts from an array of locations with different emission characteristics. Therefore, it makes little sense to use the EPA significance level of 2 ppb to establish a threshold or significance level for a single project. The existing PSD significance levels (1 to 5% of the NAAQS) and the $PM_{2.5}$ IAQR significance levels (up to 1% of the NAAQS) provide other benchmarks for use with modeled peak values. A percentage of the 8-hour ozone standard appears to be a reasonable manner to judge downwind and near-source impacts.

EPA has set no significance level for ozone modeling to date.- However, an understanding of the level of incoming background ozone/precursors and the 8-hour ozone NAAQS would be helpful in identifying an appropriate value. The current 8-hour standard is 85 ppb and, based on historical monitoring data for the 1-hour and 8-hour standard, the incoming background ozone concentrations on high ozone days for St. Louis are typically between 60-90 ppb. Based on an evaluation of 8-hour ozone episodes with predominantly southerly wind patterns (2000-02), the average incoming background concentration for the St. Louis area is 72 ppb with a standard deviation of 8-10 ppb. Therefore, with this background concentration (72 ppb) the remaining increment for the entire St. Louis area would be 13 ppb. Using the same evaluation techniques for downwind 1-hour ozone concentrations over 115 ppb, the average maximum daily ozone background concentration is 77 ppb. Therefore, with the current 1-hour standard of 125 ppb, the remaining increment would be 48 ppb. This information helps establish a position for thresholds that are a very small percentage of the NAAQS from any one source and illustrates the stringency of the 8-hour standard when compared to the 1-hour standard.

The potential size of these sources could cause "an appreciable effect" on air quality in proximity to the source. Based on the previously discussed high levels of monitored background, additional nearby exceedances might result from construction of a large upwind NOx source. Therefore, - a maximum ozone difference portion to this modeled test is reasonable, valid and necessary. This rationale is consistent with PSD program air quality analysis. A single new or modified source should be held to a very small percentage of the NAAQS to balance existing sources operation and control with new source growth. A PSD analysis that demonstrates less than a significant impact at any location requires no further evaluation.

During previous discussions on this issue, a decision was made that the modeling threshold values should be slightly more stringent than the tonnage inclusion threshold to discourage the modeling option. This will provide more certainty to potential permittees regarding outcomes necessary for compliance with this rulemaking.

Based on this assumption and a summary of the previous 8-hour ozone concentrations differences, the following information can be presented:

NOx Threshold tonnage = 900 TPOS = 5.882 TPD

Maximum 8-hour peak ozone differences

0.72 ppb @ 4.94 TPD NOx
1.24 ppb @ 9.30 TPD NOx

Maximum 8-hour ozone differences

4.32 ppb @ 4.94 TPD NOx
7.44 ppb @ 9.30 TPD NOx

If the assumption is made that these two sensitivities can be used in a linear fashion to estimate the appropriate significance level based on 900 TPOS, then a calculation can be made to approximate the significance level associated with this tonnage. This assumption is not entirely valid based on the non-linear relationship between NOx tonnage and ozone impact. However, these estimates can be used to provide a range of impacts.

0.72 ppb / 4.94 TPD * 5.882 TPD = 0.857 ppb
1.24 ppb / 9.30 TPD * 5.882 TPD = 0.784 ppb

4.32 ppb / 4.94 TPD * 5.882 TPD = 5.144 ppb
7.44 ppb / 9.30 TPD * 5.882 TPD = 4.706 ppb

The modeling analyses used to develop this relationship included approximately 330 TPOS of VOC emissions along with the NOx emissions reported. For large combustion sources addressed in this rulemaking, this amount of VOC emissions appears to be a reasonable tonnage for inclusion. The use of the modeling from the 1-hour ozone attainment demonstration has limitations with respect to use for the 8-hour ozone NAAQS. The episodes used in the attainment demonstration are severe when compared to current ozone design values for the 8-hour standard. The impact of selecting other episodes for the 8-hour attainment demonstration on this type of analysis is difficult to predict. In order to develop a policy for the 8-hour NAAQS, including a potentially revised tonnage threshold, modeling designed for the 8-hour standard must be utilized. This modeling will be developed for use in the development of the 8-hour ozone attainment demonstration for St. Louis. The methodologies for this type of study will be discussed with EPA, Illinois EPA, the regulated community, and other interested parties.

Finally, since this buffer zone strategy is designed to set forth a consistent approach for evaluating upwind NOx sources, the evaluation of these sources will not be conducted in a cumulative fashion. NOTE: The only cumulative analysis consideration might include multiple projects from a single installation. Therefore, the level of these thresholds should be protective enough to allow multiple sources to build in the same area without detrimental impacts on the downwind St. Louis area. This fact provides additional support for a small percentage threshold value.

RECOMMENDATION: Utilize one (1) percent of the 8-hour NAAQS for use in establishing the peak difference level. The implementation of this analysis would be identical to the previously completed work for the 1-hour standard except the 8-hour difference would be calculated. In addition, another portion to this modeled test of 5 percent of the standard (4.25 ppb) for the maximum modeled difference in any grid cell should be considered. Combined these two standards will provide a reasonable level of protection for the downwind St. Louis area and surrounding community while allowing potential projects with substantive NOx emissions to proceed through the permitting process.